

19-inch
FNSW-1601
FNSW-2401

16/24-Port 10/100Mbps Fast Ethernet Switch

LAN Switches



User's Manual

16/24-Port 10/100Mbps

Fast Ethernet Switch

FNSW-1601/FNSW-2401

User's Manual

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Revision

PLANET Fast Ethernet Switch User's Manual

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1. INTRODUCTION

1.1 Package Contents

Check the contents of your package for following parts:

- Fast Ethernet Switch x 1
- User's manual x 1
- Power cord x 1
- Rubber feet x 4
- Two rack-mounting brackets with attachment screws x 1

If any of these are missing or damaged, please contact your dealer immediately, if possible, retain the carton including the original packing material, and use them against to repack the product in case there is a need to return it to us for repair.

1.2 How to Use This Manual

This Fast Ethernet Switch User Manual is structured as follows:

Chapter 2 Installation

The chapter explains the feature, functionality and the physical installation of the Fast Ethernet Switch.

Chapter 3 Switch operation

The chapter explains the Fast Ethernet Switch transmit operation.

Chapter 4 Troubleshooting

The chapter explains the troubleshooting of the Fast Ethernet Switch.

Appendix A

This chapter contains cable information of the Fast Ethernet Switch.

In the following section, the term "**Fast Ethernet Switch**" means the FNSW-1601/FNSW-2401.

1.3 Product Features

- Comply with IEEE 802.3, 10Base-T, IEEE 802.3u 100Base-TX Ethernet standard
- 16/24-Port 10/100Mbps Fast Ethernet ports
- Wire-speed “**Store-and-Forward**” filtering/forwarding eliminates bad data packets with minimal delay
- 10/100Base-TX ports automatically sense and set optimal line speed from 10/20, 100/200Mbps, All 100Base-TX port support Auto-Negotiation function
- Shared buffer memory and up to 4K/8K entry MAC source address table make for fast handling of data packets
- Flow control to eliminate packets loss
- Internal, full-range power supply suitable for worldwide use
- Auto MDI/MDIX on each port for easy switch/hub cascading
- FCC, CE class A compliant

1.4 Product Specifications

Model	FNSW-1601	FNSW-2401
Hardware Specification		
Network Ports	16 10/100Base-TX RJ-45 MDI/MDI-X ports	24 10/100Base-TX RJ-45 MDI/MDI-X ports
Dimensions (W x D x H)	440 x 120 x 44 mm	
Weight (KG)	1.4 KG	1.45 KG
Power Requirement	100-240 VAC, 50/60 Hz	
Switch Specification		
Switch Architecture	Store-and-Forward	
Address Table	4K entries, auto learning/ageing	8K entries, auto learning/ageing
Shared Data Buffer	1.625Mbits	1.25Mbits
Flow Control	IEEE 802.3x full duplex operating and flow control	
Packet Control	Runt & CRC filtering, Broadcast storm control	
Switch Fabric	3.2Gbps	4.8Gbps
Switch Throughput	2.38Mpps	3.57Mpps
Standard Conformance		
Network Standards	IEEE 802.3 (Ethernet) IEEE 802.3u (Fast Ethernet) IEEE 802.3x (Flow control)	
Temperature	Operating: 0~50 Degree C Storage: -40~70 Degree C	
Humidity operating	5% to 90% (Storage) 5% to 90% (Non-condensing)	
Regulation Compliance	FCC Class A, CE	

2. INSTALLATION

This section describes the functionalities of the Fast Ethernet Switch's components and guides how to install it on the desktop. Basic knowledge of networking is assumed. Please read this chapter completely before continuing.

2.1 Product Description

The PLANET Fast Ethernet Switch is 10/100Mbps Fast Ethernet Switch with 16/24 ports respectively, and non-blocking wire-speed performance. With a 3.2/4.8Gbps internal switching fabric, the Fast Ethernet Switch can handle extremely large amounts of data in a secure topology linking to a backbone or high capacity servers.

The Fast Ethernet Switch has 4K/8K MAC Address table and provides 1.625 /1.25Mbits buffer memory. The Fast Ethernet Switch offers wire-speed packets transfer performance without risk of packet loss.

All RJ-45 copper interfaces support 10/100Mbps Auto-Negotiation for optimal speed detection through RJ-45 Category 5 or 5e cables. Support standard for Auto-MDI/MDI-X that can detect the type of connection to any Ethernet device without requiring special straight or crossover cables.

The Flow Control function allows your Fast Ethernet Switch supported routers and Servers to directly connect to this Switch for fast, reliable data transfer.

2.1.1 Product Overview

The PLANET Fast Ethernet Switch with 16/24 RJ-45 10/100Mbps ports for high-speed network connectivity. The Fast Ethernet Switch can also automatically identify and determine the correct transmission speed and half/full duplex mode of the attached devices with its 16/24 ports.

The Fast Ethernet Switch also supports Store-and-Forward forwarding scheme to ensure low latency and high data integrity, eliminates unnecessary traffic and relieves congestion on critical network paths. With an intelligent address recognition algorithm, the Fast Ethernet Switch could recognize up to 4K/8K different MAC address and enables filtering and forwarding at full wire speed.

2.1.2 Switch Front Panel

Figure 2-1 & 2-2 shows a front panel of Fast Ethernet Switch.

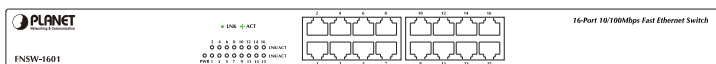


Figure 2-1 FNSW-1601 front panel

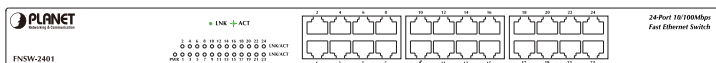


Figure 2-2 FNSW-2401 front panel

2.1.3 LED Indicators

FNSW-1601/FNSW-2401

System

LED	Color	Function
PWR	Green	Lights to indicate that the Switch is powered on.

Per 10/100Mbps port

LED	Color	Function
LNK/ACT	Green	<p>Lights: to indicate the link through that port is successfully established.</p> <p>Blink: to indicate that the Switch is actively sending or receiving data over that port.</p>

2.1.4 Switch Rear Panel

Figure 2-3 shows a rear panel of Fast Ethernet Switch.



Figure 2-3 FNSW-1601/FNSW-2401 rear panel

Power Notice:

1. The device is a power-required device, it means, it will not work till it is powered. If your networks should active all the time, please consider using UPS (Uninterrupted Power Supply) for your device. It will prevent you from network data loss or network downtime.
2. In some area, installing a surge suppression device may also help to protect your Fast Ethernet Switch from being damaged by unregulated surge or current to the Switch or the power adapter.

2.2 Installing the Switch

This part describes how to install your Fast Ethernet Switch and make connections to it. Please read the following topics and perform the procedures in the order being presented.



This Fast Ethernet Switch does not need software configuration.

2.2.1 Desktop Installation

To install the Fast Ethernet Switch on desktop, simply follow the next steps:

- Step 1:** Attach the rubber feet to the recessed areas on the bottom of the Fast Ethernet Switch.
- Step 2:** Place the Fast Ethernet Switch on desktop near an AC power source.
- Step 3:** Keep enough ventilation space between the Fast Ethernet Switch and the surrounding objects.



Note

When choosing a location, please keep in mind the environmental restrictions discussed in Chapter 1, Section 1.4 Product Specifications.

- Step 4:** Connect your Fast Ethernet Switch to network devices.
- Connect one end of a standard network cable to the 10/100 RJ-45 ports on the front of the Fast Ethernet Switch.
 - Connect the other end of the cable to the network devices such as printer servers, workstations or routers...etc.



Note

Connection to the Fast Ethernet Switch requires UTP Category 5 network cabling with RJ-45 tips. For more information, please see the Cabling Specification in Appendix A.

- Step 5:** Supply power to the Fast Ethernet Switch.
- Connect one end of the power cable to the Fast Ethernet Switch.
 - Connect the power plug of the power cable to a standard wall outlet.

When the Fast Ethernet Switch receives power, the Power LED should remain solid Green.

2.2.2 Rack Mounting

To install the Fast Ethernet Switch in a 19-inch standard rack, follow the instructions described below.

- Step 1:** Place your Fast Ethernet Switch on a hard flat surface, with the front panel positioned towards your front side.
- Step 2:** Attach a rack-mount bracket to each side of the Switch with supplied screws attached to the package. Figure 2-4 shows how to attach brackets to one side of the Fast Ethernet Switch.

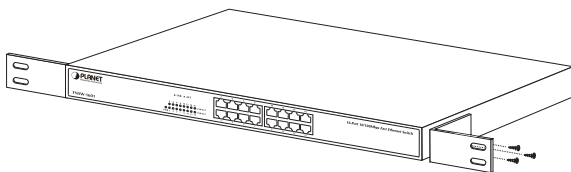


Figure 2-4 Attaching the brackets to the Fast Ethernet Switch

Caution:

You must use the screws supplied with the mounting brackets. Damage caused to the parts by using incorrect screws would invalidate your warranty.

Step 3: Secure the brackets tightly.

Step 4: Follow the same steps to attach the second bracket to the opposite side.

Step 5: After the brackets are attached to the Fast Ethernet Switch, use suitable screws to securely attach the brackets to the rack, as shown in Figure 2-5.

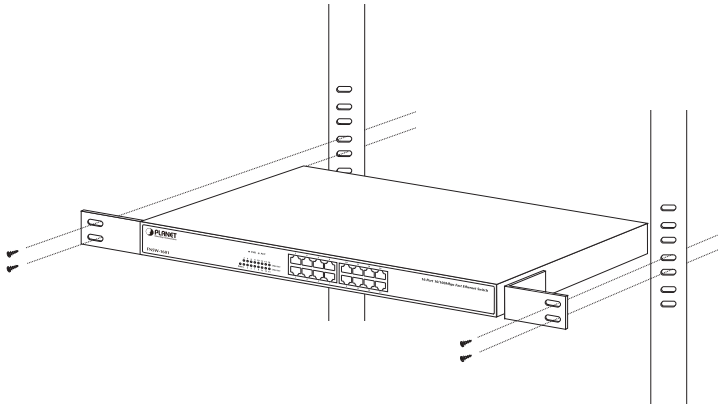


Figure 2-5 Mounting the Fast Ethernet Switch in a Rack

Step 6: Proceeds with the steps 4 and steps 5 of **session 2.2.1 Desktop Installation** to connect the network cabling and supply power to your Fast Ethernet Switch.

3. SWITCH OPERATION

3.1 Address Table

The Fast Ethernet Switch is implemented with an address table. This address table composed of many entries. Each entry is used to store the address information of some node in network, including MAC address, port no, etc. This information comes from the learning process of Fast Ethernet Switch.

3.2 Learning

When one packet comes in from any port, the Fast Ethernet Switch will record the source address, port no. And the other related information in address table. This information will be used to decide either forwarding or filtering for future packets.

3.3 Forwarding & Filtering

When one packet comes from some port of the Fast Ethernet Switch, it will also check the destination address besides the source address learning. The Fast Ethernet Switch will lookup the address-table for the destination address. If not found, this packet will be forwarded to all the other ports except the port which this packet comes in. And these ports will transmit this packet to the network it connected. If found, and the destination address is located at different port from this packet comes in, the Fast Ethernet Switch will forward this packet to the port where this destination address is located according to the information from address table. But, if the destination address is located at the same port with this packet comes in, then this packet will be filtered. There by increasing the network throughput and availability.

3.4 Store-and-Forward

Store-and-Forward is one type of packet-forwarding techniques. A Store-and Forward Fast Ethernet Switch stores the incoming frame in an internal buffer, do the complete error checking before transmission. Therefore, no error packets occurrence, it is the best choice when a network needs efficiency and stability.

The Fast Ethernet Switch scans the destination address from the packet-header, searches the routing table provided for the incoming port and forwards the packet, only if required. The fast forwarding makes the Switch attractive for connecting servers directly to the network, thereby increasing throughput and availability. However, the Switch is most commonly used to segment existing hubs, which nearly always improves overall performance. An Ethernet Switching can be easily configured in any Ethernet network environment to significantly boost bandwidth using conventional cabling and adapters.

Due to the learning function of the Fast Ethernet Switch, the source address and corresponding port number of each incoming and outgoing packet are stored in a routing table. This information is subsequently used to filter packets whose destination address is on the same segment as the source address. This confines network traffic to its respective domain, reducing the overall load on the network.

The Fast Ethernet Switch performs "**Store and Forward**" therefore, no error packets occur. More reliably, it reduces the re-transmission rate. No packet loss will occur.

3.5 Auto-Negotiation

The STP ports on the Fast Ethernet Switch have built-in "**Auto-negotiation**". This technology automatically sets the best possible bandwidth when a connection is established with another network device (usually at Power On or Reset). This is done by detect the modes and speeds at the second of both device is connected and capable of, both 10Base-T and 100Base-TX devices can connect with the port in either Half- or Full-Duplex mode.

4. TROUBLESHOOTING

This chapter contains information to help you solve issues. If the Fast Ethernet Switch is not functioning properly, make sure the Ethernet Switch was set up according to instructions in this manual.

The per port LED is not lit

Solution:

Check the cable connection of the Fast Ethernet Switch.

Performance is bad

Solution:

Check the speed duplex mode of the partner device. The Fast Ethernet Switch is run at Auto-negotiation mode and if the partner is set to half duplex, then the performance will be poor.

Per port LED is lit, but the traffic is irregular

Solution:

Check that the attached device is not set to dedicate full duplex. Some devices use a physical or software switch to change duplex modes. Auto-negotiation may not recognize this type of full-duplex setting.

Why the Fast Ethernet Switch doesn't connect to the network

Solution:

Check per port LED on the Fast Ethernet Switch. Try another port on the Fast Ethernet Switch. Make sure the cable is installed properly. Make sure the cable is the right type. Turn off the power. After a while, turn on power again.

APPENDIX A NETWORKING CONNECTION

A.1 Switch's RJ-45 Pin Assignments

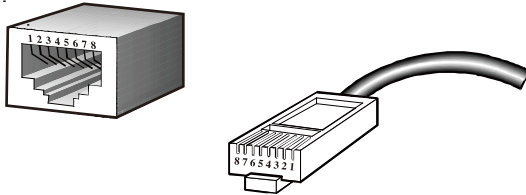
10/100Mbps, 10/100Base-TX

When connecting your 10/100Mbps Ethernet Switch to another switch, a bridge or a hub, a straight or crossover cable is necessary. Each port of the Switch supports auto-MDI/MDI-X detection. That means you can directly connect the Switch to any Ethernet devices without making a crossover cable. The following table and diagram show the standard RJ-45 receptacle/ connector and their pin assignments:

RJ-45 Connector pin assignment		
Contact	MDI Media Dependant Interface	MDI-X Media Dependant Interface -Cross
1	Tx + (transmit)	Rx + (receive)
2	Tx - (transmit)	Rx - (receive)
3	Rx + (receive)	Tx + (transmit)
4, 5	Not used	
6	Rx - (receive)	Tx - (transmit)
7, 8	Not used	

The standard cable, RJ-45 pin assignment

A.2 RJ-45 cable Pin Assignments



The standard RJ-45 receptacle/connector

There are 8 wires on a standard UTP/STP cable and each wire is color-coded. The following shows the pin allocation and color of straight cable and crossover cable connection:

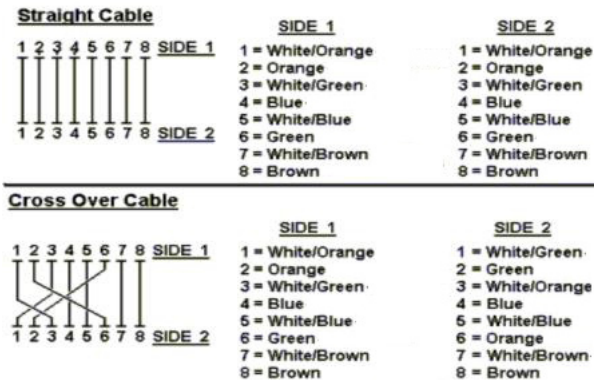


Figure A-1: Straight-Through and Crossover Cable

Please make sure your connected cables are with same pin assignment and color as above picture before deploying the cables into your network.

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